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Document 32.1 Managing Discharges to Water and Land

Recommended for approval by the ES&H Working Group

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New document or new requirements

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- ☐ New document
☒ Major requirement change

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Managing Discharges to Water and Land

1.0 Introduction

Water at LLNL is used primarily for industrial, potable, and recreational purposes. Water located in the vicinity of both LLNL's Livermore site and Site 300 is used for residential, commercial, and agricultural purposes. Wastewater at LLNL is generated and discharged from laboratory operations and discharged as shown in Figure 1., which provides an overall perspective on the four types of discharges governed by regulations that apply to LLNL. Each type of wastewater shall meet specific regulatory requirements developed to minimize wastewater discharge's adverse impacts on the environment. This *Environment, Safety & Health (ES&H) Manual* document summarizes these regulations and the controls taken by LLNL to meet these requirements.

1.1 Regulatory Background

Regulations mandate controls on wastewater discharges. How each discharge is controlled varies with the type of discharge. Figure 1 shows the following four types of wastewater discharge at LLNL:

- Discharges to surface water.
- Storm water discharges to surface water through the storm sewer.
- Discharges to land.
- Discharges to the Livermore Water Reclamation Plant (LWRP) via sanitary sewer lines.

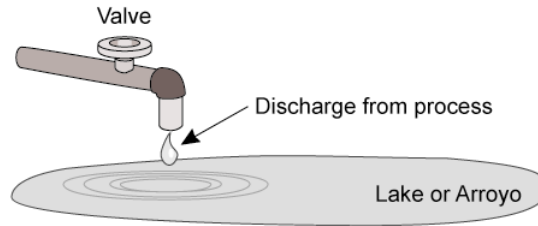
Waste discharge requirements or National Pollutant Discharge Elimination System (NPDES) permits regulate direct discharge to surface water, storm water discharge, and discharge to land. In addition to discharge controls, regulations place requirements on activities occurring within the waterways to protect the beneficial use of the waterway.

A brief regulatory background is provided in Appendix A, which summarizes requirements for:

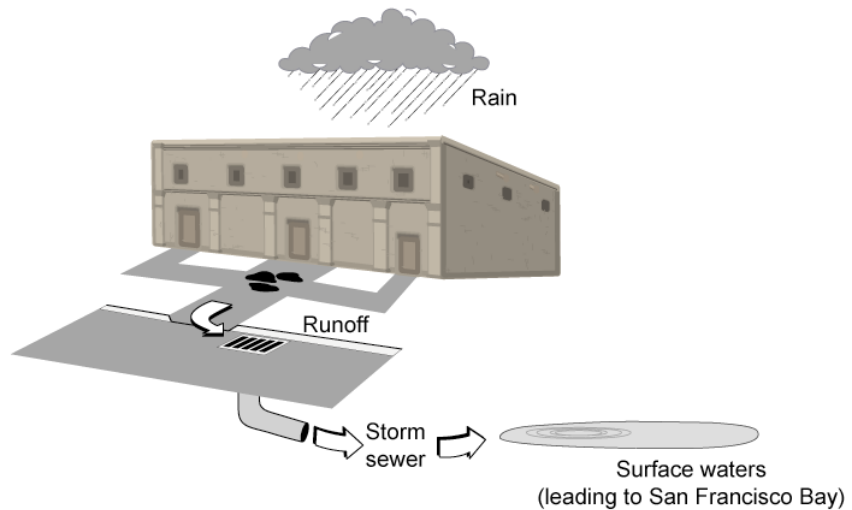
- Direct wastewater discharges controlled by waste discharge requirements or NPDES permits.
- Discharges controlled by LWRP permits.

Your ES&H Team environmental analyst can provide additional regulatory information.

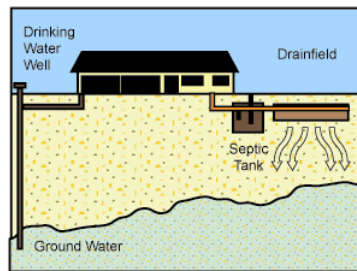
Any direct discharge to surface water (e.g., cooling water discharge to lake, arroyo, etc.)



Storm water discharge to surface water through storm sewer.



Discharge to land. Engineered discharge that discharges water into the ground, where it may affect ground water.



Discharge to sanitary sewer system [Livermore Water Reclamation Plant (LWRP)].

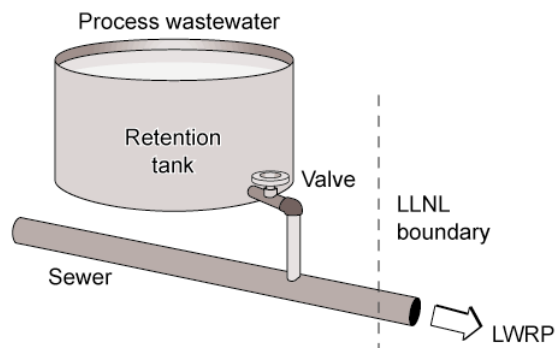


Figure 1. Types of LLNL discharges to water and land.

1.2 Scope

This document provides a broad overview of water quality programs at LLNL that regulate the discharges described in Section 1.1. Table 1 identifies the *ES&H Manual* documents where specific information and requirements regarding water quality management can be found.

Table 1. Location of additional water quality management information.

Water Quality Program	<i>ES&H Manual</i> Document
Storm water discharges	Document 32.3, "Preventing Storm Water Pollution and Oil Spills"
Retention tanks	Document 32.2, "Management of Retention Tank Systems"
Sanitary sewer discharges	Document 32.4, "Discharges to the Sanitary-Sewer System"
Drinking water	Document 13.3, "Sanitation"
Streambeds and floodplains	Document 33.1, "Floodplains and Wetlands"

2.0 Hazards

The disposal of wastewater by LLNL has the potential to impact state surface and ground water quality and quantity, as well as ecological resources. In addition, LLNL is the largest single contributor of discharged wastewater to the LWRP, accounting for 4.4% of the total volume received. Materials discharged into the sanitary sewer have the potential to harm persons engaged in activities in and around the sanitary sewer and wastewater treatment plant, upset treatment plant operations, and cause the wastewater treatment plant to violate its discharge limits.

3.0 Controls

At LLNL, all wastewater discharges are regulated using a permit or permit-like mechanism such as a waste discharge requirement.

3.1 Surface Waters, Storm Water, and Land Discharge Controls

The environmental analyst within the Water Guidance and Monitoring Group (WGMG) in the Operations and Regulatory Affairs Division (ORAD) of the Environmental Protection Department (EPD) can provide you with the most current permit conditions for wastewater discharges going to surface waters or land. Your ES&H Team environmental analyst can direct you to the WGMG environmental analyst for your area. Controls are specific to the discharge type.

3.1.1 Administrative Controls

A discharge permit or a waiver of discharge requirements shall cover all regulated wastewater discharges to ground or surface waters. Table 2 summarizes actions to be taken to obtain current information about wastewater discharges and requirements that may be applicable to your program. Permit applications often take several months to prepare, and the California Regional Water Quality Control Board (CRWQCB) requires a 180-day minimum lead time. Therefore, notify your ES&H Team environmental analyst as soon as possible if a need for a permit is identified (whether new, modified, or renewed) so a permit application can be submitted in a timely manner. Figure 2 shows the permitting process steps.

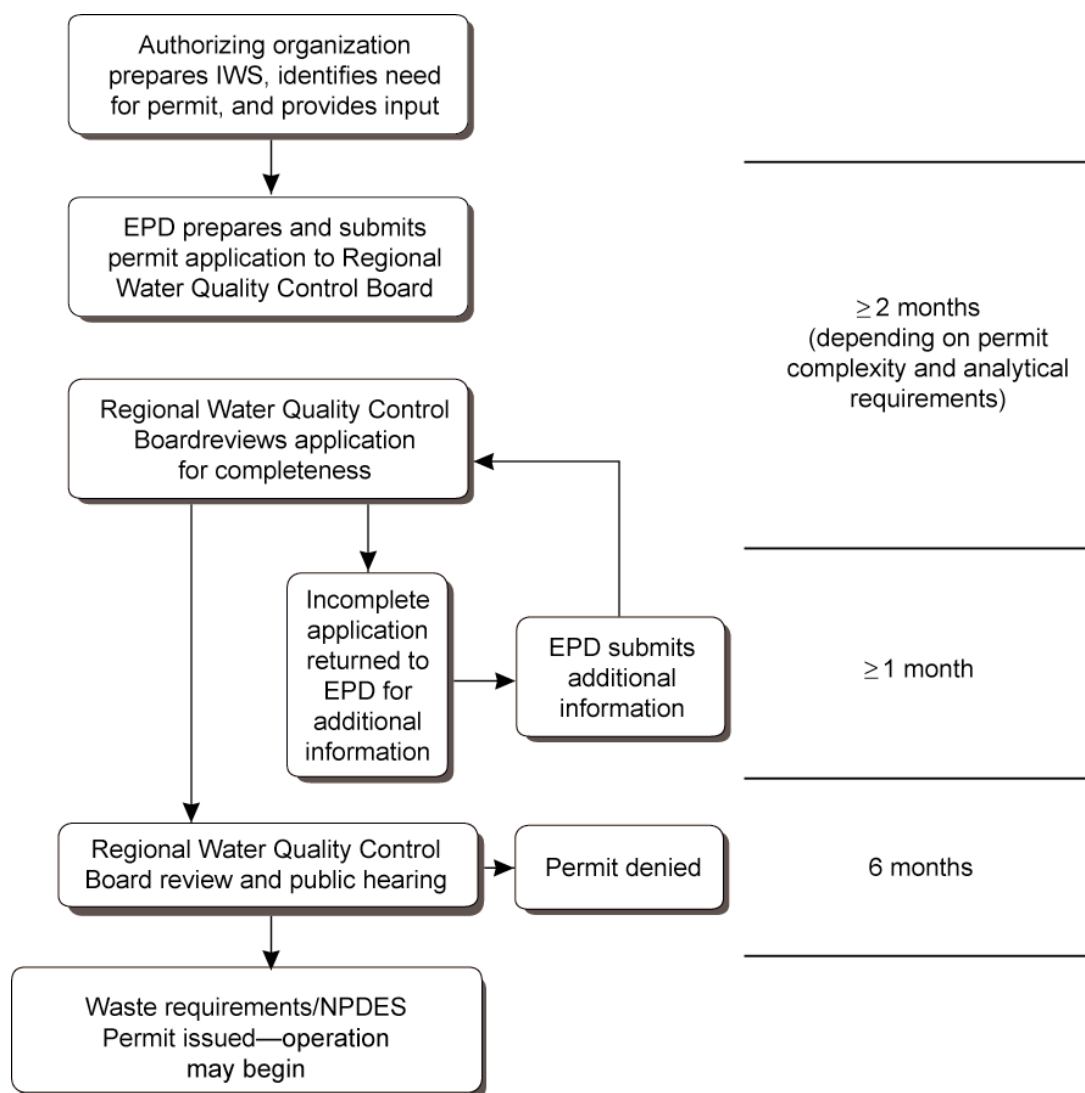


Figure 2. Wastewater discharge permitting process for discharges to surface or ground water.

As you develop your Integration Work Sheet (IWS) when initiating a new project or making changes to the scope of an existing project, ensure that your ES&H Team environmental analyst is informed as far in advance as possible of any and all potential discharges to water or land. If waste or wastewater may be discharged to new discharge points as a result of your activity, the environmental analyst can determine if the activity is regulated under an existing waste discharge requirement permit or whether a new permit is necessary. Similarly, if you are discharging wastewater in accordance with one of the permits described in Table A-1 in Appendix A, notify your ES&H Team environmental analyst of any material change in the character, location, or volume of discharge. Waste discharge requirement permits and water quality regulations are subject to periodic amendments.

Table 2. Actions to obtain information about waste discharge requirements.

If your scenario involves:	Take this action to obtain information:
Ensuring that your permit meets current requirements.	Contact your ES&H Team environmental analyst.
Discharging waste or wastewater to a new discharge point.	A new permit may be required. Contact your ES&H Team environmental analyst.
Discharging under a current permit with a material change in the discharge.	Contact your ES&H Team environmental analyst.
Planning to begin major construction (affecting 1 acre or more of land).	Contact your ES&H Team environmental analyst, file notice of intent, and develop a Construction Storm Water Pollution Prevention Plan (SWPPP).
Planning to begin a smaller construction project (affecting <1 acre of land).	Contact your ES&H Team environmental analyst and implement the best management practices identified in the Site Industrial SWPPP.
A new or modified permit, or renewal of a permit.	Contact your ES&H Team environmental analyst.
Routine reporting of compliance or special reporting of noncompliance.	Contact your ES&H Team environmental analyst.
Reporting a spill.	Contact your ES&H Team environmental analyst.

Construction projects resulting in a disturbance of 1 acre or more of land require notices of intent to comply with the state storm water permit for construction activities. Such projects shall have a Construction Storm Water Pollution Prevention Plan (SWPPP) in which erosion control will be the primary concern. Smaller construction projects at LLNL are subject to the Industrial SWPPP-required implementation of best management practices. As you develop your IWS when initiating a new project or when making changes to the scope of an existing project, ensure that your ES&H Team environmental analyst is informed as far in advance as possible of any and all construction projects and plans.

Construction storm water permits can be obtained in a much shorter time frame than individual permits. However, the notice of intent shall be filed and the SWPPP developed and approved for implementation before construction begins. Thus, lead time for planning is still necessary to avoid delays in construction schedules. In addition, the storm-water permit requires that pollution prevention measures be addressed during the planning and design processes. The design shall address storm water pollution prevention for the life of the facility and its operations (life cycle). See Document 32.3, "Preventing Storm Water Pollution and Oil Spills," in the *ES&H Manual* for more detail on storm water management requirements.

Administrative controls also include specific effluent limitations, operating conditions, prohibitions, monitoring, and reporting requirements listed in the waste discharge requirements permits. The CRWQCB usually requires routine reporting of compliance activities, including monitoring results and the status of any treatment systems. Your ES&H Team environmental analyst can provide guidance or assist you with routine reporting.

Permits include provisions for reporting noncompliance, or anticipated noncompliance with effluent limits and permit prohibitions, as well as illicit discharges and spills of oils and hazardous materials. If noncompliance or a spill occurs, contact your ES&H Team environmental analyst, who will work with the program or facility management to resolve the issue. Procedures to follow in the event of a spill are outlined in Document 22.2, "Environmental Emergency Response," in the *ES&H Manual*. After a release, EPD shall notify the appropriate regional board by telephone and submit a written report detailing the reasons for noncompliance.

Permits also detail other routine monitoring and reporting requirements that need to be followed, (e.g., monitoring effluent discharges, receiving water quality, or conducting routine inspections).

3.1.2 Engineering Controls

Engineering controls are applied as specified in the permit or as identified as a best management practice in the SWPPP applicable to the discharge. Table 3 provides examples of controls applied to LLNL discharges, but it is not intended to be a comprehensive list. Please refer to the appropriate wastewater discharge permit for engineering controls specific to your activity.

Table 3. Examples of Engineering Controls applied to LLNL wastewater discharging to ground or surface waters

Wastewater	Engineering Controls
Site 300 photo process wastewater, chemistry area rinse water, and explosives wastewater.	Retention tanks and lined class II surface impoundments.
Site 300 non-contact equipment water.	Percolation pits.
Site 300 sanitary wastes and some equipment discharges.	Sewage ponds, septic systems and leachfields.
Storm water runoff.	Covered storage, berms, diversion away from surface water drainage systems, gravel roof drain percolation trenches, etc.

3.2 Sanitary Sewer Discharge Controls

The EPD directs an internal pretreatment program designed so that LLNL meets all applicable wastewater standards and minimizes discharge volume to the LWRP when possible. The department maintains both a compliance and surveillance monitoring capability that samples effluent daily, weekly, monthly, quarterly, or continuously. Monitoring follows parameters specified by standards or as determined according to LWRP operations. The sampling schedule varies for specific types of contaminants. As you develop your IWS when initiating a new project or making changes to the scope of an existing project, ensure that your ES&H Team environmental analyst is informed as far in advance as possible of any potential discharges to the sanitary sewer.

3.2.1 Administrative controls

Wastewater Discharge Authorization

Contained wastewater discharged to the sanitary sewer is administrative-controlled though Waste Discharge Authorizations obtained through WGMG, which is responsible for approving all discharges to the sanitary sewer. When a tank or other container requires discharge, the program initiates the process by contacting their Radioactive and Hazardous Waste Management (RHWM) technician to arrange for sampling of the container contents. WGMG completes a Wastewater Discharge Authorization Record (WDAR) upon receipt of the analytical data. If the wastewater cannot be discharged to the sanitary sewer, it is treated or shipped to an offsite treatment or disposal facility through LLNL's RHWM facility.

Information and Reporting Requirements

The LWRP requires notification within 24 hours of discovering any discharge in violation of permit conditions. If you become aware of a spill or an accidental or

unauthorized release of process wastewater effluents, contact your ES&H Team environmental analyst immediately. They can confirm whether any LWRP requirements were exceeded, initiate the appropriate notification procedures, and identify further actions to be taken.

3.2.2 Engineering controls

Retention Facilities

LLNL operates a system of retention facilities to prevent elevated-concentration (slug) discharges to the sanitary sewer system. Before process wastewater is released to the LLNL collection system from high-risk facilities, potentially contaminated wastewater is collected in retention tanks, or at the facility where it is generated, and then sampled and characterized. If results show that pollutant levels are within allowable discharge limits, the volume is discharged to the sanitary sewer. Additional sampling and monitoring are performed upstream from the monitoring station and diversion facility.

Sanitary Sewer Monitoring and Diversion

The EPD samples and continuously monitors wastewater generated at LLNL. Selected parameters are set to ensure that effluents do not exceed levels beyond which the LWRP is able to treat. The combined LLNL effluent is continuously monitored for pH, selected metals, and radioactive constituents. If contaminant warning levels are reached, an alarm is activated, and the wastewater is diverted and held in the sewer diversion facility for further characterization or treatment.

4.0 Responsibilities

The responsibilities identified here are general responsibilities related to the management of discharges to water and land. For more detailed responsibilities, see the related documents in the *ES&H Manual*.

4.1 Environmental Protection Department Responsibilities

The EPD provides subject matter expert support and training to LLNL workers on discharge management issues through ORAD. In addition, EPD's RHWMD Division provides field support associated with management of wastewater that cannot be discharged to the sanitary sewer.

4.1.1 ES&H Team Environmental Analyst

ES&H Team environmental analysts shall:

- Assist workers in determining if an activity is regulated and requires a permit or other authorization.
- Provide workers conducting regulated activities with compliance guidance, including a referral to the appropriate WGMG environmental analyst when necessary.
- Respond to spills and initiate notification of the appropriate regulatory agency.

4.1.2 Water Guidance and Monitoring Group

WGMG environmental analysts shall:

- Conduct required discharge monitoring.
- Represent LLNL with the regulatory agencies on issues related to wastewater discharges and streambed or wetland protection, including applying for permits and submitting reports.
- Ensure that programs are aware for the need of required reports.
- Prepare or assist the Authorizing Organization with the preparation of required reports.
- Provide workers conducting regulated activities with compliance guidance.
- Complete a WDAR form upon receipt of analytical data for wastewater requiring disposal. The WDAR shall authorize the wastewater be either discharged to the sanitary sewer, or sent to RHWM for treatment and disposal.

4.1.3 Radioactive and Hazardous Waste Management Division

The RHWM shall:

- Manage wastewater unacceptable for discharge to the sanitary sewer, storm drains, land, or permitted waste management facilities at Site 300 (e.g. sewage ponds, surface impoundments).
- Provide field technician assistance to programs in managing discharges as stipulated by the Authorizing Organization and Appendix D, Radiological and Hazardous Waste Management Technician Services, in Document 2.1,

“Laboratory and ES&H Policies, General Worker Responsibilities, and Integrated Safety Management,” in the *ES&H Manual*.

4.2 Authorizing Organization

Authorizing organization refers to LLNL programs, services, and/or facility management chains that authorize work that can produce discharges to water and/or land. Authorizing organization responsibilities listed here are in addition to responsibilities described in Document 2.1.

4.2.1 Worker

Workers shall:

- Know the appropriate method to discharge generated wastewater.
- Immediately report to the ES&H Team environmental analyst or emergency duty officer any permit noncompliance or spills to the sanitary sewer, storm drainage system, surface waters, or the ground.

4.2.2 Responsible Individual(s)/Designee

The Responsible Individual(s)/Designee shall:

- Work with the ES&H Team environmental analyst to determine if existing permits cover new discharges to water and land or if new permits are needed.
- Ensure that activities generating wastewater are properly permitted and follow permit conditions.
- Conduct required inspections.
- Immediately report to the ES&H Team environmental analyst or emergency duty officer any permit noncompliance or spills to the sanitary sewer, storm drainage system, surface waters, or the ground.
- Ensure that reports required for permitted wastewater discharges are prepared and submitted.
- Ensure that input for required reports is provided to the WGMG environmental analyst as needed.
- Verify accuracy of reports prepared by the WGMG environmental analyst.

4.2.3 Authorizing Individual

The Authorizing Individual shall:

- Ensure that work controls are in place to properly manage discharges to sewer, water, and land.
- Designate Responsible Individual(s)/designees within the Authorizing Organization to comply with all discharge permit conditions.

5.0 Work Standards

This section specifies the work standards for management and maintenance of water quality.

5.1 Work Smart Standards

10 CFR 20.2003(a) 4, Subpart K, "Total Quantity of Radioactive Material Releases into the Sanitary Sewage in a Year."

22 CCR Sections 64650–64692, "Surface Water Treatment; Lead and Copper."

23 CCR Section 2250, "Reportable Quantity for Sewage."

23 CCR Section 2251, "Reportable Quantities for Hazardous Wastes or Hazardous Substances."

23 CCR Section 2260, "Reporting Requirements."

23 CCR Sections 2200–2236, "Waste Discharge Reports and Requirements."

23 CCR Sections 2510–2601 and appendices, "Discharges of Hazardous Waste to Land."

23 CCR Sections 3670–3719.19, "Classification of Wastewater Treatment Plants and Operator Certification."

23 CCR Sections 3855–3861, "Water Quality Certification."

33 USC 1251 et seq., Federal Water Pollution Control Act of 1948 as amended by the Clean Water Act.

33 USC 1311, 1341, 1344, Clean Water Act Dredge and Fill [and related §§ 301, 401, 404]

40 CFR 116, "Designation of Hazardous Substances."

40 CFR 117, "Determination of Reportable Quantities for Hazardous Substances."

40 CFR 122, "EPA Administered Permit Program—National Pollutant Discharge Elimination System."

40 CFR 125, "Criteria and Standards for the National Pollutant Discharge Elimination System."

40 CFR 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants."

40 CFR 144, "Underground Injection Control Program."

40 CFR 146, "Underground Injection Control Program: Criteria and Standards."

40 CFR 146.51, "Criteria and Standards Applicable to Class V Injection Wells."

40 CFR 401, "General Provisions [Pretreatment]."

40 CFR 403, "General Pretreatment Regulations for Existing and New Sources of Pollution."

40 CFR 433, "Metal Finishing Point Source Category."

40 CFR 469, "Electrical and Electronic Point Source Category."

42 USC 300h-300h-7, "Protection of Underground Sources of Drinking Water."

CA Fish and Game Code Sections 1601-1607 (except 1606), Fish and Wildlife Protection and Conservation.

CA Fish and Game Code Sections 5650-5656, Pollution, General.

CA Water Code Section 13000 et seq., Porter-Cologne Water Quality Control Act.

CA Water Code Sections 13376-13381, Discharging Pollutants or Dredged or Fill Material.

City of Livermore Public Services Ordinance Section 13.32.060, Wastewater Collection and Treatment System.

DOE Order 5400.5 Chg. 2, Radiation Protection of the Public and Environment, Chapter I, Paragraph 5.b., "Treatment of Liquid Radioactive Waste Streams [using BAT]."

DOE O 5400.5 Chg. 2, Chapter I, Paragraph 7, "Discharges to Sanitary Sewer."

DOE O 5400.5 Chg. 2, Chapter II, Paragraph 3d (2), "Controlling Long-Term Buildup of Radionuclides in Solids."

6.0 Resources for More Information

6.1 LLNL Contacts

For questions on whether a permit is needed or whether the permit conditions are being followed, contact your ES&H Team environmental analyst, who will work with a WGMG environmental analyst to assess and evaluate all regulatory issues and provide guidance on compliance approaches.

6.2 Other References

2003-2004 LLNL Ground water Discharge Permit No. 1501G (03-04).

2003-2004 LLNL Wastewater Discharge/Chemical Storage Permit No. 1250 (03-04).

California State Water Resources Control Board, General Construction Activities Storm Water Permit (Waste discharge requirement 99-08-DWQ; NPDES No. CAS000002).

California State Water Resources Control Board, General Industrial Storm Water Permit (Order 97-03-DWQ, NPDES No. CAS000001).

Central Valley Regional Water Quality Control Board Order No. 5-00-175, NPDES No. CAG995001.

Central Valley Regional Water Quality Control Board Order No. 93-100.

Central Valley Regional Water Quality Control Board Order No. 96-248.

Central Valley Regional Water Quality Control Board Order No. 97-242, NPDES No. CA0082651.

San Francisco Bay Regional Water Quality Control Board Order No. 88-075.

San Francisco Bay Regional Water Quality Control Board Order No. 95-174, NPDES No. CA 0030023.

San Francisco Bay Regional Water Quality Control Board Order No. 99-086.

Appendix A

Regulatory Background

A.1 Discharges to Land and Surface Waters

The State of California, via the State Water Resources Control Board (SWRCB), protects the quality of ground water and surface water resources. Surface water is defined broadly and includes rivers, streams (including intermittent streams), lakes, and ponds. The SWRCB sets water quality objectives through the RWQCBs to ensure that water resources can support designated recreational, domestic, commercial, industrial, and other beneficial uses.

The San Francisco Bay RWQCB regulates wastewater at the Livermore site. At Site 300, the Central Valley RWQCB regulates wastewater discharges. The regional boards regulate wastewater discharges by issuing waste discharge requirements and federal NPDES permits. In most cases, a waste discharge requirement/NPDES permit can be issued as a single permit. The NPDES permits differ in that they are limited to discharges to “waters of the United States,” which are surface waters. Waste discharge requirements also regulate waste and wastewater discharges to land and ground water. All NPDES permits are waste discharge requirements in terms of meeting discharge requirements. However, not all waste discharge requirements are NPDES permits, because a given waste discharge requirement might not include the NPDES category of discharge to United States waters. Waste discharge requirements are issued by the regional boards or State Water Resource Control Board through the issuance of a water quality order.

Table A-1 identifies the type and location of LLNL permitted discharges. This list may be updated periodically. Contact your WGMG environmental analyst for the latest information on permits for your specific activity.

A.1.1 Direct Wastewater Discharge to Surface Waters

All discharges of waste-to-surface waters require waste discharge requirement/NPDES permits. However, the waste discharge requirement/NPDES permits for discharges directly to surface waters impose different types of requirements depending on the type of discharging facility and waste characteristics. Discharge limits can be based on the known technological treatment methods within a specified industry, or based on water quality objectives for the specific pollutants discharged. Surface water waste discharge requirements (NPDES permits) are valid for five years. Permit applications for renewal shall be submitted and deemed complete by the RWQCB 180 days prior to the expiration date.

Table A-1. Waste discharge requirements

Permit	Regulated discharges	Location
San Francisco Bay RWQCB Order No. 95-174, NPDES No. CA0030023	Storm water permit for runoff associated with industrial activities and specific low-threat, non-storm water discharge.	Livermore site
Waste Discharge Requirement Order No. 99-086	Water quality permit for routine maintenance work completed in Arroyo Las Positas.	Livermore site
San Francisco Bay RWQCB Order No. 88-075	Waste management unit permit for extracted and treated ground water that is discharged to a percolation pit or used as irrigation for a pilot study extraction test.	Livermore site
Central Valley RWQCB Order No. 97-242, NPDES no. CA0082651	Direct discharge permit for discharges to Corral Hollow Creek of treated ground water from a ground water treatment system.	Site 300
Central Valley RWQCB Order No. 96-248	Waste management unit permit for discharge of high-explosive rinse water, chemistry wastewater, and photo lab rinse water to Class II surface impoundments; sanitary sewage to a domestic sewage lagoon; and non-contact mechanical equipment water to percolation pits (This permit is under revision and will be split into two permits. One permit will regulate the Class II surface impoundments, and the other permit will include all other discharges to ground).	Site 300
Central Valley RWQCB Order No. 93-100	Waste management unit permit for post-closure monitoring requirements for two Class I landfills.	Site 300
California General Industrial Activity Storm Water Permit, Order No. 97-03-DWQ, NPDES No. CAS000001	Storm water permit for runoff associated with industrial activities.	Site 300
Central Valley RWQCB Order No. 5-00-175, NPDES No. CAG995001	Direct discharge permit for large-volume discharges reaching surface waters from Site 300's drinking water system.	Site 300
California General Construction Activity Storm Water Permit, Order No. 99-08-DWQ, NPDES No. CAS000002	Storm water permit for runoff associated with construction activities covered on a project-by-project basis.	Livermore site/Site 300

A.1.2 Storm Water Discharge

At LLNL, storm water discharges associated with industrial activity are regulated under an individual waste discharge requirement/NPDES permit at the Livermore site and under a statewide general waste discharge requirement/NPDES permit at Site 300. In addition, a separate, statewide general waste discharge requirement/NPDES permit

for discharge construction activities regulates storm water discharges from construction activities.

LLNL has several independent construction projects permitted under the general permit. Construction projects disturbing 1 acre or more shall obtain coverage under the general permit by notifying the SWRCB of the intent to operate under the statewide permit. In March 2003, LLNL as a federal facility became subject to the Phase II storm water regulations for small municipalities codified in 40 Code of Federal Regulations (CFR), parts 122, 123, and 124. These regulations require LLNL to obtain a permit for municipal storm water discharges and to develop and implement a Municipal Storm Water Management Program. The municipal program will implement the required six minimum control measures and identify performance measures with measurable objectives for each of the six measures.

A more detailed discussion of storm water regulations is provided in Document 32.3, "Preventing Storm Water Pollution and Oil Spills," in the *ES&H Manual*.

A.1.3 Discharge to Waste Management Units or Engineered-to-Ground Systems

Waste discharge requirement permits shall be obtained for any discharge of waste-to-waste management units, such as surface impoundments, landfills, and waste piles, which potentially may affect ground water. Other waste discharges to the ground subject to regulation include waste discharge to systems engineered to ground (including percolation pits), irrigation (using treated ground water), and injection wells. Land disposal waste discharge requirements do not have a predetermined expiration date. However, they shall be renewed upon request of the RWQCB or when a significant change occurs in either the operation of the unit or the wastewater that is being discharged to the unit.

A.2 Discharges to Sanitary Sewer

The LWRP treats sewage and wastewater from the greater Livermore area, including sanitary effluent from LLNL. Not all LLNL discharges are directly routed to the sanitary sewer; some process waste streams are first contained and treated prior to discharge. LWRP issues two permits that regulate LLNL wastewater discharge entering the LWRP via the city collection system.

Federal, state, and local laws govern discharges to and from publicly owned treatment works, such as the LWRP. The Federal Water Pollution Control Act, as amended by the Clean Water Act in 1972, establishes non-domestic wastewater pollution control criteria and regulates direct discharge to navigable waters. The California Porter-Cologne Water Quality Control Act further regulates discharges to state waters. Local ordinances regulate discharges to the sanitary sewer.

Several different standards, limits, and prohibitions apply to the LLNL sanitary sewer discharges, and many of the regulations depend on the waste stream's point of origin. The LWRP requires that certain points of origin have their own self-monitoring program. The principal limits and standards are as follows:

- Ground water discharge standards govern Environmental Restoration Division (ERD) activities that generate ground water (e.g., contaminated or treated water from wells) eventually discharged to the sanitary sewer.
- Federal pretreatment standards govern those LLNL wastewater-generating processes identified and defined under 40 CFR 403.6 and required specific processes or subcategories.
- Local limits and general pretreatment standards [40 CFR 401, "General Provisions (Pretreatment)"] govern domestic sanitary sewage and process waste streams not otherwise regulated under other standards.

Ground water standards may be implemented under the LLNL general site-wide wastewater permit or in separate, specific ground water discharge permits from the LWRP. LLNL holds one ground water discharge permit issued by the LWRP. This permit implements standards for ERD site-wide ground water treatability studies.

Pretreatment regulations [40 CFR 403.12 (e)] require that LLNL develop and maintain a program to ensure compliance for point-source wastewater discharges. Under delegated authority to enforce those regulations, the City of Livermore's LWRP requires [under Section 2.B. of the Wastewater Discharge Permit (WDP)] that LLNL monitor identified categorical processes and submit process descriptions and monitoring results in semiannual wastewater reports due in July and January of each year. The EPD is responsible for monitoring the data and then writing reports based on the data.

As set forth in the waste discharge permit from the LWRP, the following discharges are prohibited from entering the LLNL waste stream:

- Explosive or pyrophoric solids, gases, or liquids.
- Solids or viscous substances.
- Toxic pollutants.
- Substances that would cause the LWRP to be in noncompliance with sludge use or disposal criteria.
- Odoriferous, colored, or noxious wastewater.
- Heated waters.

- Pollutants that may cause interference to the LWRP.
- Substances that cause noncompliance with the LWRP NPDES permit or receiving water standards.

In addition, the following have concentration or mass-based discharge limits applied to them:

- pH.
- Fat, oil, or grease.
- Metals (silver, arsenic, cadmium, chromium, copper, mercury, nickel, lead, zinc).
- Total toxic organics.
- Cyanide.
- Tritium.

Generators of wastewater containing prohibited or limited constituents shall comply with discharge standards established and governed by the City of Livermore Public Services Ordinance (Chapter 13.32). This ordinance provides standards for wastewater collection and treatment systems. The LWRP is responsible for enforcement and control of the ordinance standards. Failure to meet the permissible pollutant levels will incur enforcement action by the LWRP. Repeated or sustained excesses beyond levels specified in the WDP can jeopardize continued use of the LWRP sanitary sewer system by LLNL facilities.

In addition, DOE regulates discharges of radionuclides to the sanitary sewer. DOE Order 5400.5 [Chg. 2, Chapter I, Paragraph 5.b., "Treatment of Liquid Radioactive Waste Streams (using BAT)"; Chg. 2, Chapter I, Paragraph 7, "Discharges to Sanitary Sewer"; Chg. 2, Chapter II, Paragraph 3d (2), "Controlling Long-Term Buildup of Radionuclides in Solids"; and 10 CFR Part 20.2003(a) 4, Subpart K ("Total Quantity of Radioactive Material Releases into the Sanitary Sewage in a Year")] implements standards with which LLNL shall comply. DOE policy specifies that LLNL comply with all applicable local, state, and federal requirements. The annual limit on the total radioactivity that can be discharged to the sanitary sewer each year is 5 curies tritium, 1 curie carbon 14, and 1 curie all other radioactive materials combined (not including tritium).